Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions From 1,000 to 50,000 Miles
(assuming equal car effects)
Data Set ETHYL4S2
Pollutant Hydrocarbons

| Model | Change in Emissions (g/mi) from 1,000 to 50,000 mi(a) | | | ------ Rank Sum Test ------ | | | T-test |
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	0.320	0.442	+	2.0	3.0	40.00	17.09
E	0.113	0.090	-	7.0	4.5	90.00	78.55
F	0.561	0.525	-	6.0	4.5	80.00	72.81
T	0.257	0.247	-	6.0	4.5	80.00	60.46
C	0.060	0.091	+	2.0	4.5	20.00	13.41
G	0.022	0.053	+	1.0	4.5	10.00	10.49
H	0.163	0.168	+	4.0	4.5	50.00	43.29
I	0.021	0.033	+	4.0	4.5	50.00	38.46
Weighted Average(c)	0.182	0.187	+				35.50
Total				32.0	34.5	34.59	

EPA Sign Test: Observation of 5 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 36.33 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 34.59 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 35.50 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 50,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions From 1,000 to 50,000 Miles
(assuming equal car effects)
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Change in Emissions (g/mi) from 1,000 to 50,000 mi(a)			------ Rank Sum Test ------			T-test
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	-0.17	-0.15	+	2.0	3.0	40.00	36.27
E	0.23	0.19	o	6.0	4.5	80.00	77.17
F	0.65	0.31	o	7.0	4.5	90.00	87.24
T	0.07	-0.06	o	7.0	4.5	90.00	85.41
C	0.38	0.21	o	8.0	4.5	95.00	88.92
G	0.23	0.18	o	7.0	4.5	90.00	86.35
H	0.10	-0.04	o	7.0	4.5	90.00	85.28
I	0.25	0.15	o	7.0	4.5	90.00	81.64
Weighted Average(c)	0.24	0.10	o				99.71
Total				51.0	34.5	99.56	

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 99.56 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 99.71 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 50,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions From 1,000 to 50,000 Miles
(assuming equal car effects)
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Change in Emissions (g/mi) from 1,000 to 50,000 mi(a)			------ Rank Sum Test ------			T-test
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	3.52	3.71	+	2.0	3.0	40.00	21.14
E	4.28	3.21	-	9.0	4.5	100.00	94.76
F	1.99	1.10	-	9.0	4.5	100.00	99.57
T	4.55	3.78	-	7.0	4.5	90.00	78.60
C	1.21	1.52	+	4.0	4.5	50.00	22.86
G	1.52	1.08	-	6.0	4.5	80.00	77.84
H	3.08	2.64	-	8.0	4.5	95.00	94.59
I	1.02	1.00	-	5.0	4.5	65.00	54.80
Weighted Average(c)	2.57	2.15	-				99.82
Total				50.0	34.5	99.30	

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 99.30 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 99.82 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 50,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions from 1,000 to 50,000 Miles
(not assuming equal car effects)
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Change in Emissions from 1,000 to 50,000 mi (g/mi)(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.320	0.442	+	0.02
E	0.113	0.090	-	94.31
F	0.561	0.525	-	75.92
T	0.257	0.247	-	67.65
C	0.060	0.091	+	3.63
G	0.022	0.053	+	0.90
H	0.163	0.168	+	37.21
I	0.021	0.033	+	28.50
Weighted Average(c)	0.182	0.187	+	28.85

EPA Sign Test: Observation of 5 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 36.33 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 28.85 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 50,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions from 1,000 to 50,000 Miles
(not assuming equal car effects)
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Change in Emissions from 1,000 to 50,000 mi (g/mi)(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	-0.17	-0.15	+	26.22
E	0.23	0.19	-	93.26
F	0.65	0.31	-	100.00
T	0.07	-0.06	-	99.27
C	0.38	0.21	-	100.00
G	0.23	0.18	-	99.99
H	0.10	-0.04	-	99.88
I	0.25	0.15	-	99.91
Weighted Average(c)	0.24	0.10	-	100.00

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 100.00 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 50,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions from 1,000 to 50,000 Miles
(not assuming equal car effects)
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Change in Emissions from 1,000 to 50,000 mi (g/mi)(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	3.52	3.71	+	24.48
E	4.28	3.21	-	99.83
F	1.99	1.10	-	100.00
T	4.55	3.78	-	96.14
C	1.21	1.52	+	18.29
G	1.52	1.08	-	99.61
H	3.08	2.64	-	90.23
I	1.02	1.00	-	53.42
Weighted Average(c)	2.57	2.15	-	99.99

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis
of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at
the 99.99 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 50,000 miles minus the mean of the
   car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Integrated Emissions Test
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Emissions Rate Increase (g/mi) from 1,000 to 50,000 mi(a)			------ Rank Sum Test ------			T-test
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	0.187	0.243	+	0.0	3.0	10.00	4.59
E	0.068	0.085	+	2.0	4.5	20.00	19.18
F	0.308	0.306	-	5.0	4.5	65.00	54.90
T	0.124	0.144	+	3.0	4.5	35.00	18.03
C	0.051	0.086	+	0.0	4.5	5.00	1.51
G	0.028	0.058	+	0.0	4.5	5.00	1.91
H	0.089	0.098	+	4.0	4.5	50.00	29.39
I	0.011	0.030	+	3.0	4.5	35.00	17.90
Weighted Average(c)	0.102	0.119	+				0.30
Total				17.0	34.5	0.28	

EPA Sign Test: Observation of 7 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 3.52 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 0.28 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 0.30 percent significance level(b).

Notes:
a. Each figure is the mean of the emissions rate increases for each car. The emissions rate increase is the estimated total emissions (in g) from 1,000 to 50,000 miles, divided by the accumulated mileage, minus the initial emissions rate at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Integrated Emissions Test
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Emissions Rate Increase (g/mi) from 1,000 to 50,000 mi(a)			------ Rank Sum Test ------			T-test
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	-0.11	-0.14	-	3.0	3.0	60.00	69.63
E	0.19	0.14	-	8.0	4.5	95.00	93.86
F	0.34	0.21	-	9.0	4.5	100.00	100.00
T	0.06	-0.16	-	9.0	4.5	100.00	94.25
C	0.26	0.17	-	9.0	4.5	100.00	97.30
G	0.22	0.18	-	9.0	4.5	100.00	92.91
H	0.04	0.05	+	5.0	4.5	65.00	45.91
I	0.19	0.13	-	7.0	4.5	90.00	85.47
Weighted Average(c)	0.16	0.08	-				98.56
Total				59.0	34.5	99.99	

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 99.99 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 98.56 percent significance level(b).

Notes:
a. Each figure is the mean of the emissions rate increases for each car. The emissions rate increase is the estimated total emissions (in g) from 1,000 to 50,000 miles, divided by the accumulated mileage, minus the initial emissions rate at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Integrated Emissions Test
Data Set ETHYL4S2
Pollutant Carbon Monoxide

| Model | Emissions Rate Increase (g/mi) from 1,000 to 50,000 mi(a) | | | ------ Rank Sum Test ------ | | | T-test |
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	1.84	1.83	-	4.0	3.0	80.00	51.74
E	2.24	2.43	+	3.0	4.5	35.00	36.10
F	0.99	0.48	-	9.0	4.5	100.00	99.48
T	2.07	2.00	-	6.0	4.5	80.00	66.48
C	1.23	1.27	+	2.0	4.5	20.00	42.15
G	1.05	1.02	-	6.0	4.5	80.00	71.84
H	1.80	1.63	-	6.0	4.5	80.00	78.43
I	0.73	0.77	+	3.0	4.5	35.00	42.66
Weighted Average(c)	1.47	1.37	-				86.17
Total				39.0	34.5	76.23	

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 76.23 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 86.17 percent significance level(b).

Notes:
a. Each figure is the mean of the emissions rate increases for each car. The emissions rate increase is the estimated total emissions (in g) from 1,000 to 50,000 miles, divided by the accumulated mileage, minus the initial emissions rate at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Integrated Emissions Test
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Emissions Rate Increase (g/mi) from 5,000 to 50,000 mi(a)			Rank Sum Test			T-test
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	0.190	0.223	+	1.0	3.0	20.00	12.34
E	0.042	0.033	-	5.0	4.5	65.00	70.55
F	0.253	0.243	-	6.0	4.5	80.00	69.03
T	0.092	0.105	+	3.0	4.5	35.00	17.86
C	0.034	0.062	+	1.0	4.5	10.00	10.68
G	0.018	0.046	+	0.0	4.5	5.00	0.79
H	0.089	0.066	-	6.0	4.5	80.00	78.48
I	0.016	0.020	+	4.0	4.5	50.00	37.63
Weighted Average(c)	0.086	0.087	+				44.86
Total				26.0	34.5	8.88	

EPA Sign Test: Observation of 5 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 36.33 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 8.88 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 44.86 percent significance level(b).

Notes:
a. Each figure is the mean of the emissions rate increases for each car. The emissions rate increase is the estimated total emissions (in g) from 5,000 to 50,000 miles, divided by the accumulated mileage, minus the initial emissions rate at 5,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 21, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Integrated Emissions Test
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

| Model | Emissions Rate Increase (g/mi) from 5,000 to 50,000 mi(a) | | | ------ Rank Sum Test ------ | | | T-test |
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	-0.13	-0.09	+	0.0	3.0	10.00	11.62
E	0.10	0.14	+	3.0	4.5	35.00	16.53
F	0.24	0.05	-	9.0	4.5	100.00	99.02
T	-0.03	-0.00	+	4.0	4.5	50.00	41.15
C	0.13	0.06	-	7.0	4.5	90.00	91.45
G	0.14	0.10	-	9.0	4.5	100.00	99.37
H	0.05	-0.07	-	9.0	4.5	100.00	99.08
I	0.05	0.11	+	3.0	4.5	35.00	18.33
Weighted Average(c)	0.08	0.03	-				98.47
Total				44.0	34.5	93.41	

EPA Sign Test: Observation of 4 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 63.67 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 93.41 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 98.47 percent significance level(b).

Notes:
a. Each figure is the mean of the emissions rate increases for each car. The emissions rate increase is the estimated total emissions (in g) from 5,000 to 50,000 miles, divided by the accumulated mileage, minus the initial emissions rate at 5,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 21, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Integrated Emissions Test
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Emissions Rate Increase (g/mi) from 5,000 to 50,000 mi(a)			------ Rank Sum Test ------			T-test
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	1.91	1.95	+	4.0	3.0	80.00	43.52
E	1.90	1.53	-	8.0	4.5	95.00	93.56
F	0.75	0.38	-	9.0	4.5	100.00	99.22
T	1.57	1.31	-	7.0	4.5	90.00	91.25
C	1.11	1.06	-	3.0	4.5	35.00	61.01
G	0.64	0.75	+	0.0	4.5	5.00	2.06
H	1.75	1.52	-	9.0	4.5	100.00	88.62
I	0.57	0.63	+	4.0	4.5	50.00	33.67
Weighted Average(c)	1.25	1.09	-				99.69
Total				44.0	34.5	93.41	

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 93.41 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 99.69 percent significance level(b).

Notes:
a. Each figure is the mean of the emissions rate increases for each car. The emissions rate increase is the estimated total emissions (in g) from 5,000 to 50,000 miles, divided by the accumulated mileage, minus the initial emissions rate at 5,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 21, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Mean Effects of HiTEC 3000
Data Set: ETHYL4S2
Pollutant: Hydrocarbons

OBSERVED INTEGRATED EMISSIONS PER MILE

Beginning Mileage	Ending Mileage	Scaling	Mean Integrated Emissions (a)		HiTEC 3000 Effect (b)
			HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
1,000	50,000	Unscaled	0.279	0.263	0.015
1,000	50,000	Scaled (c)	0.281	0.263	0.018
50,000	75,000	Unscaled	0.357	0.340	0.017
50,000	75,000	Scaled (c)	0.360	0.340	0.019
1,000	75,000	Unscaled	0.305	0.289	0.016
1,000	75,000	Scaled (c)	0.307	0.289	0.018

OBSERVED MEAN EMISSIONS

Mileage	Scaling	Weighted Average Emissions (d)		HiTEC 3000 Effect (b)
		HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
25,000	Unscaled	0.274	0.272	0.002
25,000	Scaled (c)	0.277	0.272	0.005
50,000	Unscaled	0.346	0.344	0.003
50,000	Scaled (c)	0.349	0.344	0.005
75,000	Unscaled	0.357	0.329	0.028
75,000	Scaled (c)	0.360	0.329	0.031
1,000	Unscaled	0.159	0.162	-0.002

Notes

(a) For each car, the emissions are integrated from the beginning mileage to the ending mileage and expressed as a rate in g/mi. Each figure is the mean of the car rates, weighting models by 1988 sales.
(b) These numbers give the average difference in emissions (HiTEC 3000 minus EEE).
(c) The HiTEC 3000 emissions are rescaled by subtraction of the initial difference between HiTEC 3000 and EEE, given in the final row of the table.
(d) Each figure is the mean of the car-means at the given mileage.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Mean Effects of HiTEC 3000
Data Set: ETHYL4S2
Pollutant: Nitrogen Oxides

OBSERVED INTEGRATED EMISSIONS PER MILE

Beginning Mileage	Ending Mileage	Scaling	Mean Integrated Emissions (a) HiTEC 3000 (g/mi)	EEE (g/mi)	HiTEC 3000 Effect (b) (g/mi)
1,000	50,000	Unscaled	0.44	0.49	-0.05
1,000	50,000	Scaled (c)	0.42	0.49	-0.07
50,000	75,000	Unscaled	0.48	0.67	-0.19
50,000	75,000	Scaled (c)	0.46	0.67	-0.21
1,000	75,000	Unscaled	0.45	0.55	-0.10
1,000	75,000	Scaled (c)	0.43	0.55	-0.11

OBSERVED MEAN EMISSIONS

Mileage	Scaling	Weighted Average Emissions (d) HiTEC 3000 (g/mi)	EEE (g/mi)	HiTEC 3000 Effect (b) (g/mi)
25,000	Unscaled	0.48	0.52	-0.04
25,000	Scaled (c)	0.47	0.52	-0.05
50,000	Unscaled	0.45	0.58	-0.12
50,000	Scaled (c)	0.44	0.58	-0.14
75,000	Unscaled	0.47	0.72	-0.25
75,000	Scaled (c)	0.46	0.72	-0.27
1,000	Unscaled	0.35	0.34	0.02

Notes

(a) For each car, the emissions are integrated from the beginning mileage to the ending mileage and expressed as a rate in g/mi. Each figure is the mean of the car rates, weighting models by 1988 sales.

(b) These numbers give the average difference in emissions (HiTEC 3000 minus EEE).

(c) The HiTEC 3000 emissions are rescaled by subtraction of the initial difference between HiTEC 3000 and EEE, given in the final row of the table.

(d) Each figure is the mean of the car-means at the given mileage.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Mean Effects of HiTEC 3000
Data Set: ETHYL4S2
Pollutant: Carbon Monoxide

OBSERVED INTEGRATED EMISSIONS PER MILE

Beginning Mileage	Ending Mileage	Scaling	Mean Integrated Emissions (a) HiTEC 3000 (g/mi)	EEE (g/mi)	HiTEC 3000 Effect (b) (g/mi)
1,000	50,000	Unscaled	2.78	2.84	-0.06
1,000	50,000	Scaled (c)	2.75	2.84	-0.09
50,000	75,000	Unscaled	3.76	4.20	-0.44
50,000	75,000	Scaled (c)	3.72	4.20	-0.47
1,000	75,000	Unscaled	3.11	3.30	-0.18
1,000	75,000	Scaled (c)	3.08	3.30	-0.22

OBSERVED MEAN EMISSIONS

Mileage	Scaling	Weighted Average Emissions (d) HiTEC 3000 (g/mi)	EEE (g/mi)	HiTEC 3000 Effect (b) (g/mi)
25,000	Unscaled	2.83	3.03	-0.20
25,000	Scaled (c)	2.79	3.03	-0.23
50,000	Unscaled	3.55	3.95	-0.40
50,000	Scaled (c)	3.52	3.95	-0.43
75,000	Unscaled	3.54	3.86	-0.33
75,000	Scaled (c)	3.50	3.86	-0.36
1,000	Unscaled	1.41	1.38	0.03

Notes

(a) For each car, the emissions are integrated from the beginning mileage to the ending mileage and expressed as a rate in g/mi. Each figure is the mean of the car rates, weighting models by 1988 sales.

(b) These numbers give the average difference in emissions (HiTEC 3000 minus EEE).

(c) The HiTEC 3000 emissions are rescaled by subtraction of the initial difference between HiTEC 3000 and EEE, given in the final row of the table.

(d) Each figure is the mean of the car-means at the given mileage.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Mean Effects of HiTEC 3000
Data Set: ETHYL4S
Pollutant: Hydrocarbons

OBSERVED INTEGRATED EMISSIONS PER MILE

| Beginning Mileage | Ending Mileage | Scaling | Mean Integrated Emissions (a) | | HiTEC 3000 Effect (b) |
			HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
1,000	50,000	Unscaled	0.279	0.263	0.016
1,000	50,000	Scaled (c)	0.282	0.263	0.018
50,000	75,000	Unscaled	0.358	0.340	0.018
50,000	75,000	Scaled (c)	0.360	0.340	0.020
1,000	75,000	Unscaled	0.305	0.289	0.016
1,000	75,000	Scaled (c)	0.307	0.289	0.019

OBSERVED MEAN EMISSIONS

| Mileage | Scaling | Weighted Average Emissions (d) | | HiTEC 3000 Effect (b) |
		HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
25,000	Unscaled	0.274	0.272	0.002
25,000	Scaled (c)	0.277	0.272	0.005
50,000	Unscaled	0.352	0.340	0.012
50,000	Scaled (c)	0.354	0.340	0.014
75,000	Unscaled	0.357	0.329	0.028
75,000	Scaled (c)	0.360	0.329	0.031
1,000	Unscaled	0.159	0.162	-0.002

Notes

(a) For each car, the emissions are integrated from the beginning mileage to the ending mileage and expressed as a rate in g/mi. Each figure is the mean of the car rates, weighting models by 1988 sales.

(b) These numbers give the average difference in emissions (HiTEC 3000 minus EEE).

(c) The HiTEC 3000 emissions are rescaled by subtraction of the initial difference between HiTEC 3000 and EEE, given in the final row of the table.

(d) Each figure is the mean of the car-means at the given mileage.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Mean Effects of HiTEC 3000
Data Set: ETHYL4S
Pollutant: Nitrogen Oxides

OBSERVED INTEGRATED EMISSIONS PER MILE

Beginning Mileage	Ending Mileage	Scaling	Mean Integrated Emissions (a)		HiTEC 3000 Effect (b)
			HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
1,000	50,000	Unscaled	0.44	0.49	-0.05
1,000	50,000	Scaled (c)	0.42	0.49	-0.07
50,000	75,000	Unscaled	0.48	0.67	-0.19
50,000	75,000	Scaled (c)	0.46	0.67	-0.21
1,000	75,000	Unscaled	0.45	0.55	-0.10
1,000	75,000	Scaled (c)	0.43	0.55	-0.11

OBSERVED MEAN EMISSIONS

Mileage	Scaling	Weighted Average Emissions (d)		HiTEC 3000 Effect (b)
		HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
25,000	Unscaled	0.48	0.52	-0.04
25,000	Scaled (c)	0.47	0.52	-0.05
50,000	Unscaled	0.46	0.58	-0.12
50,000	Scaled (c)	0.45	0.58	-0.13
75,000	Unscaled	0.47	0.72	-0.25
75,000	Scaled (c)	0.46	0.72	-0.27
1,000	Unscaled	0.35	0.34	0.02

Notes

(a) For each car, the emissions are integrated from the beginning mileage to the ending mileage and expressed as a rate in g/mi. Each figure is the mean of the car rates, weighting models by 1988 sales.

(b) These numbers give the average difference in emissions (HiTEC 3000 minus EEE).

(c) The HiTEC 3000 emissions are rescaled by subtraction of the initial difference between HiTEC 3000 and EEE, given in the final row of the table.

(d) Each figure is the mean of the car-means at the given mileage.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Mean Effects of HiTEC 3000
Data Set: ETHYL4S
Pollutant: Carbon Monoxide

OBSERVED INTEGRATED EMISSIONS PER MILE

Beginning Mileage	Ending Mileage	Scaling	Mean Integrated Emissions (a)		HiTEC 3000 Effect (b)
			HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
1,000	50,000	Unscaled	2.80	2.84	-0.05
1,000	50,000	Scaled (c)	2.76	2.84	-0.08
50,000	75,000	Unscaled	3.77	4.19	-0.42
50,000	75,000	Scaled (c)	3.74	4.19	-0.45
1,000	75,000	Unscaled	3.12	3.29	-0.17
1,000	75,000	Scaled (c)	3.09	3.29	-0.20

OBSERVED MEAN EMISSIONS

Mileage	Scaling	Weighted Average Emissions (d)		HiTEC 3000 Effect (b)
		HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
25,000	Unscaled	2.83	3.03	-0.20
25,000	Scaled (c)	2.79	3.03	-0.23
50,000	Unscaled	3.73	3.92	-0.19
50,000	Scaled (c)	3.70	3.92	-0.22
75,000	Unscaled	3.54	3.86	-0.33
75,000	Scaled (c)	3.50	3.86	-0.36
1,000	Unscaled	1.41	1.38	0.03

Notes

(a) For each car, the emissions are integrated from the beginning mileage to the ending mileage and expressed as a rate in g/mi. Each figure is the mean of the car rates, weighting models by 1988 sales.

(b) These numbers give the average difference in emissions (HiTEC 3000 minus EEE).

(c) The HiTEC 3000 emissions are rescaled by subtraction of the initial difference between HiTEC 3000 and EEE, given in the final row of the table.

(d) Each figure is the mean of the car-means at the given mileage.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Mean Effects of HiTEC 3000
Data Set: ETHYL4S3
Pollutant: Hydrocarbons

OBSERVED INTEGRATED EMISSIONS PER MILE

Beginning Mileage	Ending Mileage	Scaling	Mean Integrated Emissions (a)		HiTEC 3000 Effect (b)
			HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
1,000	50,000	Unscaled	0.279	0.264	0.015
1,000	50,000	Scaled (c)	0.281	0.264	0.017
50,000	75,000	Unscaled	0.341	0.347	-0.006
50,000	75,000	Scaled (c)	0.343	0.347	-0.003
1,000	75,000	Unscaled	0.299	0.291	0.008
1,000	75,000	Scaled (c)	0.301	0.291	0.010

OBSERVED MEAN EMISSIONS

Mileage	Scaling	Weighted Average Emissions (d)		HiTEC 3000 Effect (b)
		HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
25,000	Unscaled	0.274	0.272	0.002
25,000	Scaled (c)	0.277	0.272	0.005
50,000	Unscaled	0.341	0.344	-0.003
50,000	Scaled (c)	0.343	0.344	-0.001
75,000	Unscaled	0.340	0.336	0.004
75,000	Scaled (c)	0.343	0.336	0.006
1,000	Unscaled	0.159	0.162	-0.002

Notes

(a) For each car, the emissions are integrated from the beginning mileage to the ending mileage and expressed as a rate in g/mi. Each figure is the mean of the car rates, weighting models by 1988 sales.

(b) These numbers give the average difference in emissions (HiTEC 3000 minus EEE).

(c) The HiTEC 3000 emissions are rescaled by subtraction of the initial difference between HiTEC 3000 and EEE, given in the final row of the table.

(d) Each figure is the mean of the car-means at the given mileage.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Mean Effects of HiTEC 3000
Data Set: ETHYL4S3
Pollutant: Nitrogen Oxides

OBSERVED INTEGRATED EMISSIONS PER MILE

Beginning Mileage	Ending Mileage	Scaling	Mean Integrated Emissions (a)		HiTEC 3000 Effect (b)
			HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
1,000	50,000	Unscaled	0.44	0.49	-0.05
1,000	50,000	Scaled (c)	0.42	0.49	-0.07
50,000	75,000	Unscaled	0.47	0.67	-0.20
50,000	75,000	Scaled (c)	0.45	0.67	-0.22
1,000	75,000	Unscaled	0.45	0.55	-0.10
1,000	75,000	Scaled (c)	0.43	0.55	-0.12

OBSERVED MEAN EMISSIONS

Mileage	Scaling	Weighted Average Emissions (d)		HiTEC 3000 Effect (b)
		HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
25,000	Unscaled	0.48	0.52	-0.04
25,000	Scaled (c)	0.47	0.52	-0.05
50,000	Unscaled	0.46	0.58	-0.12
50,000	Scaled (c)	0.44	0.58	-0.14
75,000	Unscaled	0.46	0.72	-0.26
75,000	Scaled (c)	0.45	0.72	-0.28
1,000	Unscaled	0.35	0.34	0.02

Notes

(a) For each car, the emissions are integrated from the beginning mileage to the ending mileage and expressed as a rate in g/mi. Each figure is the mean of the car rates, weighting models by 1988 sales.

(b) These numbers give the average difference in emissions (HiTEC 3000 minus EEE).

(c) The HiTEC 3000 emissions are rescaled by subtraction of the initial difference between HiTEC 3000 and EEE, given in the final row of the table.

(d) Each figure is the mean of the car-means at the given mileage.

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Mean Effects of HiTEC 3000
Data Set: ETHYL4S3
Pollutant: Carbon Monoxide

OBSERVED INTEGRATED EMISSIONS PER MILE

Beginning Mileage	Ending Mileage	Scaling	Mean Integrated Emissions (a)		HiTEC 3000 Effect (b)
			HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
1,000	50,000	Unscaled	2.79	2.85	-0.06
1,000	50,000	Scaled (c)	2.75	2.85	-0.09
50,000	75,000	Unscaled	3.45	4.25	-0.80
50,000	75,000	Scaled (c)	3.42	4.25	-0.83
1,000	75,000	Unscaled	3.01	3.31	-0.31
1,000	75,000	Scaled (c)	2.97	3.31	-0.34

OBSERVED MEAN EMISSIONS

Mileage	Scaling	Weighted Average Emissions (d)		HiTEC 3000 Effect (b)
		HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
25,000	Unscaled	2.83	3.03	-0.20
25,000	Scaled (c)	2.79	3.03	-0.23
50,000	Unscaled	3.54	3.95	-0.41
50,000	Scaled (c)	3.50	3.95	-0.45
75,000	Unscaled	3.20	3.92	-0.72
75,000	Scaled (c)	3.17	3.92	-0.75
1,000	Unscaled	1.41	1.38	0.03

Notes

(a) For each car, the emissions are integrated from the beginning mileage to the ending mileage and expressed as a rate in g/mi. Each figure is the mean of the car rates, weighting models by 1988 sales.

(b) These numbers give the average difference in emissions (HiTEC 3000 minus EEE).

(c) The HiTEC 3000 emissions are rescaled by subtraction of the initial difference between HiTEC 3000 and EEE, given in the final row of the table.

(d) Each figure is the mean of the car-means at the given mileage.

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Et..yl Corporation HiTEC 3000 Fleet Testing Program

Mean Effects of HiTEC 3000
Data Set: ETHYL4S4
Pollutant: Hydrocarbons

OBSERVED INTEGRATED EMISSIONS PER MILE

Beginning Mileage	Ending Mileage	Scaling	Mean Integrated Emissions (a)		HiTEC 3000 Effect (b)
			HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
1,000	50,000	Unscaled	0.278	0.262	0.016
1,000	50,000	Scaled (c)	0.280	0.262	0.019
50,000	75,000	Unscaled	0.353	0.335	0.018
50,000	75,000	Scaled (c)	0.355	0.335	0.020
1,000	75,000	Unscaled	0.303	0.286	0.017
1,000	75,000	Scaled (c)	0.305	0.286	0.019

OBSERVED MEAN EMISSIONS

Mileage	Scaling	Weighted Average Emissions (d)		HiTEC 3000 Effect (b)
		HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
25,000	Unscaled	0.274	0.271	0.003
25,000	Scaled (c)	0.277	0.271	0.006
50,000	Unscaled	0.339	0.336	0.003
50,000	Scaled (c)	0.341	0.336	0.005
75,000	Unscaled	0.358	0.329	0.029
75,000	Scaled (c)	0.360	0.329	0.031
1,000	Unscaled	0.159	0.162	-0.002

Notes

(a) For each car, the emissions are integrated from the beginning mileage to the ending mileage and expressed as a rate in g/mi. Each figure is the mean of the car rates, weighting models by 1988 sales.

(b) These numbers give the average difference in emissions (HiTEC 3000 minus EEE).

(c) The HiTEC 3000 emissions are rescaled by subtraction of the initial difference between HiTEC 3000 and EEE, given in the final row of the table.

(d) Each figure is the mean of the car-means at the given mileage.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Mean Effects of HiTEC 3000
Data Set: ETHYL4S4
Pollutant: Nitrogen Oxides

OBSERVED INTEGRATED EMISSIONS PER MILE

Beginning Mileage	Ending Mileage	Scaling	Mean Integrated Emissions (a) HiTEC 3000 (g/mi)	EEE (g/mi)	HiTEC 3000 Effect (b) (g/mi)
1,000	50,000	Unscaled	0.43	0.49	-0.05
1,000	50,000	Scaled (c)	0.42	0.49	-0.07
50,000	75,000	Unscaled	0.47	0.65	-0.19
50,000	75,000	Scaled (c)	0.45	0.65	-0.20
1,000	75,000	Unscaled	0.44	0.54	-0.10
1,000	75,000	Scaled (c)	0.43	0.54	-0.11

OBSERVED MEAN EMISSIONS

Mileage	Scaling	Weighted Average Emissions (d) HiTEC 3000 (g/mi)	EEE (g/mi)	HiTEC 3000 Effect (b) (g/mi)
25,000	Unscaled	0.48	0.52	-0.03
25,000	Scaled (c)	0.47	0.52	-0.05
50,000	Unscaled	0.43	0.55	-0.12
50,000	Scaled (c)	0.41	0.55	-0.14
75,000	Unscaled	0.47	0.72	-0.25
75,000	Scaled (c)	0.46	0.72	-0.27
1,000	Unscaled	0.35	0.34	0.02

Notes

(a) For each car, the emissions are integrated from the beginning mileage to the ending mileage and expressed as a rate in g/mi. Each figure is the mean of the car rates, weighting models by 1988 sales.

(b) These numbers give the average difference in emissions (HiTEC 3000 minus EEE).

(c) The HiTEC 3000 emissions are rescaled by subtraction of the initial difference between HiTEC 3000 and EEE, given in the final row of the table.

(d) Each figure is the mean of the car-means at the given mileage.

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Mean Effects of HiTEC 3000
Data Set: ETHYL4S4
Pollutant: Carbon Monoxide

OBSERVED INTEGRATED EMISSIONS PER MILE

Beginning Mileage	Ending Mileage	Scaling	Mean Integrated Emissions (a)		HiTEC 3000 Effect (b)
			HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
1,000	50,000	Unscaled	2.76	2.82	-0.06
1,000	50,000	Scaled (c)	2.73	2.82	-0.09
50,000	75,000	Unscaled	3.63	4.04	-0.41
50,000	75,000	Scaled (c)	3.59	4.04	-0.45
1,000	75,000	Unscaled	3.05	3.23	-0.17
1,000	75,000	Scaled (c)	3.02	3.23	-0.21

OBSERVED MEAN EMISSIONS

Mileage	Scaling	Weighted Average Emissions (d)		HiTEC 3000 Effect (b)
		HiTEC 3000 (g/mi)	EEE (g/mi)	(g/mi)
25,000	Unscaled	2.83	3.08	-0.26
25,000	Scaled (c)	2.79	3.08	-0.29
50,000	Unscaled	3.44	3.83	-0.40
50,000	Scaled (c)	3.41	3.83	-0.43
75,000	Unscaled	3.52	3.84	-0.33
75,000	Scaled (c)	3.48	3.84	-0.36
1,000	Unscaled	1.41	1.38	0.03

Notes

(a) For each car, the emissions are integrated from the beginning mileage to the ending mileage and expressed as a rate in g/mi. Each figure is the mean of the car rates, weighting models by 1988 sales.

(b) These numbers give the average difference in emissions (HiTEC 3000 minus EEE).

(c) The HiTEC 3000 emissions are rescaled by subtraction of the initial difference between HiTEC 3000 and EEE, given in the final row of the table.

(d) Each figure is the mean of the car-means at the given mileage.

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Linear Regression Slopes Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.077	0.091	+	3.18
E	0.021	0.013	-	98.34
F	0.108	0.098	-	94.17
T	0.048	0.048	+	47.05
C	0.010	0.017	+	2.41
G	0.006	0.013	+	0.35
H	0.031	0.033	+	32.25
I	0.002	0.006	+	14.95
Weighted Average(c)	0.035	0.036	+	36.40

EPA Sign Test: Observation of 6 '+' sign(s) in 8 trials rejects the hypothesis
of no adverse HiTEC 3000 effect at the 14.45 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect
is rejected at the 36.40 percent significance level(b).

Notes:
a. The deterioration rate is the rate of increase per 10,000 miles (slope of the
   linear regression line).
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 21, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Linear Regression Slopes Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	-0.04	-0.03	+	19.40
E	0.04	0.04	+	48.19
F	0.10	0.03	-	100.00
T	-0.01	0.01	+	6.68
C	0.06	0.02	-	100.00
G	0.03	0.03	-	73.41
H	0.02	-0.02	-	99.45
I	0.03	0.02	-	83.36
Weighted Average(c)	0.03	0.01	-	100.00

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 100.00 percent significance level(b).

Notes:
a. The deterioration rate is the rate of increase per 10,000 miles (slope of the linear regression line).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 21, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Linear Regression Slopes Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.82	0.80	-	62.24
E	0.80	0.58	-	99.69
F	0.35	0.17	-	100.00
T	0.79	0.69	-	94.45
C	0.29	0.33	+	27.70
G	0.20	0.20	-	58.33
H	0.61	0.60	-	57.26
I	0.17	0.13	-	81.47
Weighted Average(c)	0.48	0.42	-	99.91

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 99.91 percent significance level(b).

Notes:
a. The deterioration rate is the rate of increase per 10,000 miles (slope of the linear regression line).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 21, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Linear Regression Deterioration Factors Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Deterioration Factor(a) EEE	HT3	Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
D	2.167	2.291	+	24.59
E	1.792	1.394	-	99.42
F	3.042	2.687	-	92.38
T	2.049	1.894	-	90.73
C	1.321	1.455	+	12.41
G	1.258	1.486	+	2.50
H	1.715	1.778	+	31.51
I	1.064	1.141	+	16.33
Weighted Average(c)	1.767	1.725	-	78.07

EPA Sign Test: Observation of 5 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 36.33 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 78.07 percent significance level(b).

Notes:
a. The deterioration factor is the fitted (from the linear regression) 50,000 mile emissions divided by the fitted 4,000 mile emissions.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures. The weighted average deterioration factor is not the ratio of the averages at 4,000 and 50,000 miles.

Systems Applications Inc.
March 21, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Linear Regression Deterioration Factors Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Deterioration Factor(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.64	0.74	+	10.45
E	1.79	1.83	+	39.62
F	1.71	1.23	-	99.99
T	0.92	1.05	+	8.90
C	2.32	1.46	-	99.71
G	1.55	1.45	-	71.30
H	1.23	0.83	-	99.20
I	1.34	1.23	-	77.94
Weighted Average(c)	1.45	1.20	-	100.00

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 100.00 percent significance level(b).

Notes:
a. The deterioration factor is the fitted (from the linear regression) 50,000 mile emissions divided by the fitted 4,000 mile emissions.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures. The weighted average deterioration factor is not the ratio of the averages at 4,000 and 50,000 miles.

Systems Applications Inc.
March 21, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Linear Regression Deterioration Factors Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Deterioration Factor(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	3.16	3.03	-	67.80
E	2.42	1.77	-	99.94
F	2.98	2.09	-	99.96
T	2.87	2.38	-	97.23
C	1.76	1.80	+	41.94
G	1.71	1.67	-	57.63
H	2.48	2.69	+	21.96
I	1.40	1.30	-	79.72
Weighted Average(c)	2.29	2.07	-	99.16

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis
of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect
is rejected at the 99.16 percent significance level(b).

Notes:
a. The deterioration factor is the fitted (from the linear regression) 50,000
   mile emissions divided by the fitted 4,000 mile emissions.
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.
   The weighted average deterioration factor is not the ratio of the averages at
   4,000 and 50,000 miles.

Systems Applications Inc.
March 21, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Violation Mileage Test
50,000 Mile Analysis
(based on linear regression)
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Violation Mileage(a) (miles)		Sign ('+'= adverse HT3 effect)
	EEE	HT3	
D	17,522	13,176	+
E	99,000	99,000	0
F	19,275	18,753	+
T	46,361	38,240	+
C	99,000	99,000	0
G	99,000	99,000	0
H	99,000	99,000	0
I	99,000	99,000	0

EPA Sign Test: Observation of 3 '+' sign(s) in 3 trial(s) rejects the hypothesis of no adverse HiTEC 3000 effect at the 12.50 percent significance level(b). (For the purpose of the sign test, only observations with sign = + or - are counted as trials.)

Notes:
a. The violation mileage is the mileage (fitted by the linear regression line) at which the standard is reached. Violation mileage = 0 if the zero mile emissions exceed the standard. Violation mileage = 99,000 if the regression line lies entirely below the standard between 0 and 50,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.

Systems Applications Inc.
March 21, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Violation Mileage Test
50,000 Mile Analysis
(based on linear regression)
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Violation Mileage(a) (miles)		Sign ('+'= adverse HT3 effect)
	EEE	HT3	
D	99,000	99,000	0
E	99,000	99,000	0
F	42,297	99,000	-
T	99,000	99,000	0
C	99,000	99,000	0
G	99,000	99,000	0
H	99,000	99,000	0
I	99,000	99,000	0

EPA Sign Test: Observation of 0 '+' sign(s) in 1 trial(s) rejects the hypothesis
of no adverse HiTEC 3000 effect at the 100.00 percent significance level(b).
(For the purpose of the sign test, only observations with sign = + or - are
counted as trials.)

Notes:
a. The violation mileage is the mileage (fitted by the linear regression line)
   at which the standard is reached. Violation mileage = 0 if the zero
   mile emissions exceed the standard. Violation mileage = 99,000 if the
   regression line lies entirely below the standard between 0 and 50,000 miles.
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.

Systems Applications Inc.
March 21, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Violation Mileage Test
50,000 Mile Analysis
(based on linear regression)
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Violation Mileage(a) (miles)		Sign ('+'= adverse HT3 effect)
	EEE	HT3	
D	24,426	23,875	+
E	13,911	2,397	+
F	99,000	99,000	0
T	22,236	19,725	+
C	99,000	49,381	+
G	99,000	99,000	0
H	28,463	33,236	-
I	99,000	99,000	0

EPA Sign Test: Observation of 4 '+' sign(s) in 5 trial(s) rejects the hypothesis of no adverse HiTEC 3000 effect at the 18.75 percent significance level(b). (For the purpose of the sign test, only observations with sign = + or - are counted as trials.)

Notes:
a. The violation mileage is the mileage (fitted by the linear regression line) at which the standard is reached. Violation mileage = 0 if the zero mile emissions exceed the standard. Violation mileage = 99,000 if the regression line lies entirely below the standard between 0 and 50,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.

Systems Applications Inc.
March 21, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Maximum Percentage of Vehicles Failing Standard Test
50,000 Mile Analysis
(based on linear regression)
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Maximum Estimated Percentage Failures (mileage)(a)		Sign ('+'= adverse HT3 effect)
	EEE	HT3	
D	100.00 (50,000)	100.00 (50,000)	0
E	0.00 (50,000)	0.00 (50,000)	0
F	100.00 (50,000)	100.00 (50,000)	0
T	69.50 (50,000)	95.13 (50,000)	+
C	0.00 (50,000)	0.00 (50,000)	0
G	0.00 (50,000)	0.00 (50,000)	0
H	4.23 (50,000)	5.19 (50,000)	+
I	0.00 (50,000)	0.00 (50,000)	0

EPA Sign Test: Observation of 2 '+' sign(s) in 2 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 25.00 percent significance level(b). (For the purpose of the sign test, only observations with sign = + or - are counted as trials.)

Notes:
a. For each mileage the percentage of vehicles failing the standard is estimated using the linear regression line. The first figure is the maximum percentage over all mileages from 0 to 50,000 miles. The figure in parentheses is the mileage at which the maximum occurs and is 0 if the slope is negative and 50,000 if the slope is positive.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.

Systems Applications Inc.
March 22, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Maximum Percentage of Vehicles Failing Standard Test
50,000 Mile Analysis
(based on linear regression)
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Maximum Estimated Percentage Failures (mileage)(a)		Sign ('+'= adverse HT3 effect)
	EEE	HT3	
D	0.00 (0)	0.00 (0)	0
E	0.00 (50,000)	0.00 (50,000)	0
F	73.82 (50,000)	0.95 (50,000)	-
T	3.49 (0)	0.01 (50,000)	-
C	0.00 (50,000)	0.00 (50,000)	0
G	0.00 (50,000)	0.00 (50,000)	0
H	0.00 (50,000)	0.00 (0)	0
I	0.00 (50,000)	0.00 (50,000)	0

EPA Sign Test: Observation of 0 '+' sign(s) in 2 trials rejects the hypothesis
of no adverse HiTEC 3000 effect at the 100.00 percent significance level(b).
(For the purpose of the sign test, only observations with sign = + or -
are counted as trials.)

Notes:
a. For each mileage the percentage of vehicles failing the standard is estimated
   using the linear regression line. The first figure is the maximum percentage
   over all mileages from 0 to 50,000 miles. The figure in parentheses
   is the mileage at which the maximum occurs and is 0 if the slope is negative
   and 50,000 if the slope is positive.
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.

Systems Applications Inc.
March 22, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Maximum Percentage of Vehicles Failing Standard Test
50,000 Mile Analysis
(based on linear regression)
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Maximum Estimated Percentage Failures (mileage)(a)		Sign ('+'= adverse HT3 effect)
	EEE	HT3	
D	100.00 (50,000)	100.00 (50,000)	0
E	100.00 (50,000)	100.00 (50,000)	0
F	0.00 (50,000)	0.00 (50,000)	0
T	100.00 (50,000)	99.99 (50,000)	-
C	31.69 (50,000)	51.38 (50,000)	+
G	0.09 (50,000)	0.07 (50,000)	-
H	99.58 (50,000)	97.80 (50,000)	-
I	4.02 (50,000)	1.84 (50,000)	-

EPA Sign Test: Observation of 1 '+' sign(s) in 5 trials rejects the hypothesis
of no adverse HiTEC 3000 effect at the 96.87 percent significance level(b).
(For the purpose of the sign test, only observations with sign = + or -
are counted as trials.)

Notes:
a. For each mileage the percentage of vehicles failing the standard is estimated
   using the linear regression line. The first figure is the maximum percentage
   over all mileages from 0 to 50,000 miles. The figure in parentheses
   is the mileage at which the maximum occurs and is 0 if the slope is negative
   and 50,000 if the slope is positive.
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.

Systems Applications Inc.
March 22, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

25,000 Mile Quadratic Regression Slope Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	25K Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.078	0.092	+	2.51
E	0.021	0.014	-	98.56
F	0.109	0.098	-	95.62
T	0.047	0.048	+	44.49
C	0.011	0.017	+	1.28
G	0.007	0.014	+	0.04
H	0.031	0.033	+	32.27
I	0.003	0.006	+	14.45
Weighted Average(c)	0.035	0.036	+	34.37

EPA Sign Test: Observation of 6 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 14.45 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 34.37 percent significance level(b).

Notes:
a. The 25k deterioration rate is the rate of increase per 10,000 miles at 25,000 miles (slope of the quadratic regression curve at 25,000 miles).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

25,000 Mile Quadratic Regression Slope Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	25K Deterioration Rate(a) (rate / 10,000 mi) EEE	HT3	Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
D	-0.04	-0.03	+	14.36
E	0.04	0.04	+	47.66
F	0.10	0.03	-	100.00
T	-0.01	0.01	+	6.40
C	0.06	0.02	-	100.00
G	0.03	0.03	-	83.50
H	0.02	-0.02	-	99.45
I	0.03	0.02	-	84.40
Weighted Average(c)	0.03	0.01	-	100.00

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 100.00 percent significance level(b).

Notes:
a. The 25k deterioration rate is the rate of increase per 10,000 miles at 25,000 miles (slope of the quadratic regression curve at 25,000 miles).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

25,000 Mile Quadratic Regression Slope Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	25K Deterioration Rate(a) (rate / 10,000 mi) EEE	HT3	Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
D	0.82	0.80	-	61.97
E	0.80	0.59	-	99.75
F	0.35	0.17	-	100.00
T	0.79	0.69	-	94.12
C	0.29	0.33	+	26.75
G	0.21	0.20	-	58.45
H	0.61	0.60	-	58.44
I	0.17	0.13	-	82.21
Weighted Average(c)	0.48	0.42	-	99.95

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 99.95 percent significance level(b).

Notes:
a. The 25k deterioration rate is the rate of increase per 10,000 miles at 25,000 miles (slope of the quadratic regression curve at 25,000 miles).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3u00 Fleet Testing Program

50,000 Mile Quadratic Regression Slope Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	50K Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.041	0.035	-	59.05
E	0.025	-0.020	-	99.98
F	0.070	0.023	-	97.85
T	0.068	0.033	-	99.41
C	-0.013	-0.024	-	85.95
G	-0.014	-0.026	-	94.01
H	0.009	0.019	+	25.59
I	-0.007	-0.009	-	57.47
Weighted Average(c)	0.021	0.005	-	99.69

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 99.69 percent significance level(b).

Notes:
a. The 50k deterioration rate is the rate of increase per 10,000 miles at 50,000 miles (slope of the quadratic regression curve at 50,000 miles).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

50,000 Mile Quadratic Regression Slope Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	50K Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.06	0.09	+	22.80
E	0.02	-0.00	-	82.11
F	0.05	-0.00	-	88.19
T	-0.00	0.14	+	0.12
C	0.04	-0.02	-	94.51
G	-0.11	-0.09	+	14.92
H	0.00	-0.08	-	93.98
I	-0.03	-0.06	-	77.87
Weighted Average(c)	0.00	-0.02	-	87.12

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 87.12 percent significance level(b).

Notes:
a. The 50k deterioration rate is the rate of increase per 10,000 miles at 50,000 miles (slope of the quadratic regression curve at 50,000 miles).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

50,000 Mile Quadratic Regression Slope Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	50K Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+' = adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	1.00	0.83	-	80.46
E	1.00	-0.11	-	100.00
F	0.31	0.19	-	90.67
T	0.99	0.64	-	94.09
C	-0.30	-0.18	+	29.55
G	-0.14	-0.37	-	96.56
H	0.06	0.22	+	19.34
I	-0.07	-0.19	-	79.15
Weighted Average(c)	0.26	0.10	-	98.97

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 98.97 percent significance level(b).

Notes:
a. The 50k deterioration rate is the rate of increase per 10,000 miles at 50,000 miles (slope of the quadratic regression curve at 50,000 miles).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Quadratic Coefficient Test
50,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Acceleration (a) (units per 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	-0.007	-0.011	-	78.06
E	0.001	-0.007	-	99.91
F	-0.008	-0.015	-	94.72
T	0.004	-0.003	-	99.58
C	-0.005	-0.008	-	96.01
G	-0.004	-0.008	-	99.47
H	-0.004	-0.003	+	29.13
I	-0.002	-0.003	-	68.83
Weighted Average(c)	-0.003	-0.006	-	99.84

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 99.84 percent significance level(b).

Notes:
a. The acceleration is the quadratic coefficient of the quadratic regression curve (half the rate of increase of the deterioration rate).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Quadratic Coefficient Test
50,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Acceleration (a) (units per 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.02	0.02	+	31.52
E	-0.01	-0.01	-	83.34
F	-0.01	-0.01	+	40.82
T	0.00	0.03	+	0.33
C	-0.00	-0.01	-	69.35
G	-0.03	-0.02	+	8.86
H	-0.00	-0.01	-	81.22
I	-0.01	-0.01	-	69.54
Weighted Average(c)	-0.01	-0.01	+	44.80

EPA Sign Test: Observation of 4 '+' sign(s) in 8 trials rejects the hypothesis
of no adverse HiTEC 3000 effect at the 63.67 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is
rejected at the 44.80 percent significance level(b).

Notes:
a. The acceleration is the quadratic coefficient of the quadratic regression
   curve (half the rate of increase of the deterioration rate).
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Quadratic Coefficient Test
50,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Acceleration (a) (units per 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.04	0.01	-	78.96
E	0.04	-0.14	-	99.95
F	-0.01	0.01	+	21.91
T	0.04	-0.01	-	87.95
C	-0.12	-0.10	+	35.20
G	-0.07	-0.11	-	96.58
H	-0.11	-0.08	+	16.93
I	-0.05	-0.06	-	71.94
Weighted Average(c)	-0.04	-0.06	-	92.85

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 92.85 percent significance level(b).

Notes:
a. The acceleration is the quadratic coefficient of the quadratic regression curve (half the rate of increase of the deterioration rate).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Quadratic Regression Deterioration Factors Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Deterioration Factor(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	2.183	2.325	+	22.05
E	1.792	1.352	-	99.79
F	3.136	2.808	-	89.45
T	2.037	1.897	-	89.11
C	1.287	1.415	+	12.64
G	1.213	1.439	+	1.58
H	1.710	1.777	+	30.88
I	1.047	1.118	+	19.28
Weighted Average(c)	1.768	1.726	-	77.11

EPA Sign Test: Observation of 5 '+' sign(s) in 8 trials rejects the hypothesis
of no adverse HiTEC 3000 effect at the 36.33 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is
rejected at the 77.11 percent significance level(b).

Notes:
a. The deterioration factor is the fitted (from the quadratic regression)
   50,000 mile emissions divided by the fitted 4,000 mile emissions.
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.
   The weighted average deterioration factor is not the ratio of the averages at
   4,000 and 50,000 miles.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Quadratic Regression Deterioration Factors Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Deterioration Factor(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.74	0.83	+	7.15
E	1.79	1.84	+	39.31
F	1.70	1.21	-	99.99
T	0.92	1.13	+	1.48
C	2.35	1.43	-	99.71
G	1.48	1.38	-	76.62
H	1.22	0.77	-	99.47
I	1.30	1.17	-	82.13
Weighted Average(c)	1.44	1.17	-	100.00

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis
of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is
rejected at the 100.00 percent significance level(b).

Notes:
a. The deterioration factor is the fitted (from the quadratic regression)
   50,000 mile emissions divided by the fitted 4,000 mile emissions.
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.
   The weighted average deterioration factor is not the ratio of the averages at
   4,000 and 50,000 miles.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Quadratic Regression Deterioration Factors Test
50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Deterioration Factor(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	3.11	3.02	-	61.90
E	2.40	1.77	-	99.94
F	3.01	2.08	-	99.97
T	2.82	2.39	-	95.83
C	1.75	1.81	+	41.31
G	1.70	1.64	-	60.99
H	2.58	2.79	+	23.40
I	1.38	1.27	-	82.84
Weighted Average(c)	2.30	2.09	-	98.73

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 98.73 percent significance level(b).

Notes:
a. The deterioration factor is the fitted (from the quadratic regression) 50,000 mile emissions divided by the fitted 4,000 mile emissions.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures. The weighted average deterioration factor is not the ratio of the averages at 4,000 and 50,000 miles.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Violation Mileage Test
50,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Violation Mileage(a) (miles)		Sign ('+'= adverse HT3 effect)
	EEE	HT3	
D	16,082	12,298	+
E	99,000	99,000	0
F	18,007	16,404	+
T	44,929	37,841	+
C	99,000	99,000	0
G	99,000	99,000	0
H	99,000	99,000	0
I	99,000	99,000	0

EPA Sign Test: Observation of 3 '+' sign(s) in 3 trial(s) rejects the hypothesis of no adverse HiTEC 3000 effect at the 12.50 percent significance level(b). (For the purpose of the sign test, only observations with sign = + or - are counted as trials.)

Notes:
a. The violation mileage is the mileage (fitted by the quadratic regression curve) at which the standard is reached. Violation mileage = 0 if the zero mile emissions exceed the standard. Violation mileage = 99,000 if the regression curve lies entirely below the standard between 0 and 50,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Violation Mileage Test
50,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Violation Mileage(a) (miles)		Sign ('+'= adverse HT3 effect)
	EEE	HT3	
D	99,000	99,000	0
E	99,000	99,000	0
F	43,206	99,000	-
T	99,000	99,000	0
C	99,000	99,000	0
G	99,000	99,000	0
H	99,000	99,000	0
I	99,000	99,000	0

EPA Sign Test: Observation of 0 '+' sign(s) in 1 trial(s) rejects the hypothesis
of no adverse HiTEC 3000 effect at the 100.00 percent significance level(b).
(For the purpose of the sign test, only observations with sign = + or - are
counted as trials.)

Notes:
a. The violation mileage is the mileage (fitted by the quadratic regression
   curve) at which the standard is reached. Violation mileage = 0 if the
   zero mile emissions exceed the standard. Violation mileage = 99,000 if
   the regression curve lies entirely below the standard between 0 and
   50,000 miles.
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Violation Mileage Test
50,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Violation Mileage(a) (miles)		Sign ('+'= adverse HT3 effect)
	EEE	HT3	
D	25,486	24,058	+
E	14,470	5,831	+
F	99,000	99,000	0
T	23,377	19,425	+
C	99,000	99,000	0
G	99,000	99,000	0
H	24,351	30,815	-
I	99,000	99,000	0

EPA Sign Test: Observation of 3 '+' sign(s) in 4 trial(s) rejects the hypothesis of no adverse HiTEC 3000 effect at the 31.25 percent significance level(b). (For the purpose of the sign test, only observations with sign = + or - are counted as trials.)

Notes:
a. The violation mileage is the mileage (fitted by the quadratic regression curve) at which the standard is reached. Violation mileage = 0 if the zero mile emissions exceed the standard. Violation mileage = 99,000 if the regression curve lies entirely below the standard between 0 and 50,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Maximum Percentage of Vehicles Failing Standard Test
50,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Maximum Estimated Percentage Failures (mileage)(a)		Sign ('+'= adverse HT3 effect)
	EEE	HT3	
D	100.00 (50,000)	100.00 (50,000)	0
E	0.00 (50,000)	0.00 (35,088)	0
F	100.00 (50,000)	100.00 (50,000)	0
T	84.48 (50,000)	91.29 (50,000)	+
C	0.00 (36,380)	0.00 (35,370)	0
G	0.00 (32,918)	0.00 (33,607)	0
H	1.23 (50,000)	2.39 (50,000)	+
I	0.00 (31,929)	0.00 (34,874)	0

EPA Sign Test: Observation of 2 '+' sign(s) in 2 trials rejects the hypothesis
of no adverse HiTEC 3000 effect at the 25.00 percent significance level(b).
(For the purpose of the sign test, only observations with sign = + or - are
counted as trials.)

Notes:
a. For each mileage the percentage of vehicles failing the standard is estimated
   using the quadratic regression curve. The first figure is the maximum
   percentage over all mileages from 0 to 50,000 miles. The figure in parentheses
   is the mileage at which the maximum occurs.
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.

Systems Applications Inc.
March 26, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Maximum Percentage of Vehicles Failing Standard Test
50,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Maximum Estimated Percentage Failures (mileage)(a)		Sign ('+'= adverse HT3 effect)
	EEE	HT3	
D	0.00 (0)	0.00 (0)	0
E	0.00 (50,000)	0.00 (47,899)	0
F	63.54 (50,000)	0.48 (47,107)	-
T	3.32 (0)	0.11 (50,000)	-
C	0.00 (50,000)	0.00 (38,471)	0
G	0.00 (30,815)	0.00 (30,971)	0
H	0.00 (50,000)	0.00 (17,570)	0
I	0.00 (36,054)	0.00 (30,727)	0

EPA Sign Test: Observation of 0 '+' sign(s) in 2 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 100.00 percent significance level(b). (For the purpose of the sign test, only observations with sign = + or - are counted as trials.)

Notes:
a. For each mileage the percentage of vehicles failing the standard is estimated using the quadratic regression curve. The first figure is the maximum percentage over all mileages from 0 to 50,000 miles. The figure in parentheses is the mileage at which the maximum occurs.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.

Systems Applications Inc.
March 26, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Maximum Percentage of Vehicles Failing Standard Test
50,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Carbon Monoxide

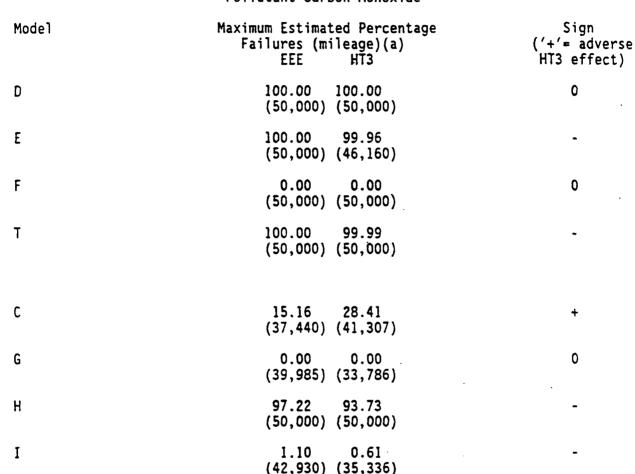| Model	Maximum Estimated Percentage Failures (mileage)(a)		Sign ('+'= adverse HT3 effect)
	EEE	HT3	
D	100.00 (50,000)	100.00 (50,000)	0
E	100.00 (50,000)	99.96 (46,160)	-
F	0.00 (50,000)	0.00 (50,000)	0
T	100.00 (50,000)	99.99 (50,000)	-
C	15.16 (37,440)	28.41 (41,307)	+
G	0.00 (39,985)	0.00 (33,786)	0
H	97.22 (50,000)	93.73 (50,000)	-
I	1.10 (42,930)	0.61 (35,336)	-

EPA Sign Test: Observation of 1 '+' sign(s) in 5 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 96.87 percent significance level(b). (For the purpose of the sign test, only observations with sign = + or - are counted as trials.)

Notes:
a. For each mileage the percentage of vehicles failing the standard is estimated using the quadratic regression curve. The first figure is the maximum percentage over all mileages from 0 to 50,000 miles. The figure in parentheses is the mileage at which the maximum occurs.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.

Systems Applications Inc.
March 26, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Cause or Contribute Test
50,000 Mile Analysis
(based on linear regression)
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	First Mileage at which Failure to Meet Standards Is Caused (. = not caused)(a)	Percent Failures		Sign ('+'= adverse HT3 effect)
		EEE	HT3	
D	5,000	5.41	10.77	+
E	.	.	.	-
F	11,000	7.17	10.87	+
T	30,000	1.09	12.27	+
C	.	.	.	-
G	.	.	.	-
H	.	.	.	-
I	.	.	.	-

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b). (For the purpose of the sign test, only observations with sign = + or - are counted as trials.)

Notes:
a. If a number appears in this column then at this mileage, the percentage failures due to HiTEC 3000 estimated from the linear regression line exceeds both ten percent and the estimated percentage failures due to EEE. The number that appears is the first mileage for which these conditions occur. A period appears if these conditions do not occur for any mileage up to 50,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.

Systems Applications Inc.
March 22, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Cause or Contribute Test
50,000 Mile Analysis
(based on linear regression)
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	First Mileage at which Failure to Meet Standards Is Caused (. = not caused)(a)	Percent Failures		Sign ('+'= adverse HT3 effect)
		EEE	HT3	
D	.	.	.	-
E	.	.	.	-
F	.	.	.	-
T	.	.	.	-
C	.	.	.	-
G	.	.	.	-
H	.	.	.	-
I	.	.	.	-

EPA Sign Test: Observation of 0 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 100.00 percent significance level(b). (For the purpose of the sign test, only observations with sign = + or - are counted as trials.)

Notes:
a. If a number appears in this column then at this mileage, the percentage failures due to HiTEC 3000 estimated from the linear regression line exceeds both ten percent and the estimated percentage failures due to EEE. The number that appears is the first mileage for which these conditions occur. A period appears if these conditions do not occur for any mileage up to 50,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.

Systems Applications Inc.
March 22, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Cause or Contribute Test
50,000 Mile Analysis
(based on linear regression)
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	First Mileage at which Failure to Meet Standards Is Caused (. = not caused)(a)	Percent Failures		Sign ('+'= adverse HT3 effect)
		EEE	HT3	
D	18,000	10.45	13.01	+
E	0	5.56	42.09	+
F	.	.	.	-
T	10,000	3.81	10.86	+
C	27,000	5.37	10.54	+
G	.	.	.	-
H	.	.	.	-
I	.	.	.	-

EPA Sign Test: Observation of 4 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 63.67 percent significance level(b). (For the purpose of the sign test, only observations with sign = + or - are counted as trials.)

Notes:
a. If a number appears in this column then at this mileage, the percentage failures due to HiTEC 3000 estimated from the linear regression line exceeds both ten percent and the estimated percentage failures due to EEE. The number that appears is the first mileage for which these conditions occur. A period appears if these conditions do not occur for any mileage up to 50,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.

Systems Applications Inc.
March 22, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Cause or Contribute Test
50,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	First Mileage at which Failure to Meet Standards Is Caused (. = not caused)(a)	Percent Failures		Sign ('+'= adverse HT3 effect)
		EEE	HT3	
D	7,000	6.01	11.90	+
E	.	.	.	-
F	11,000	5.82	10.08	+
T	29,000	0.29	12.48	+
C	.	.	.	-
G	.	.	.	-
H	.	.	.	-
I	.	.	.	-

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b). (For the purpose of the sign test, only observations with sign = + or - are counted as trials).

Notes:
a. If a number appears in this column then at this mileage, the percentage failures
   due to HiTEC 3000 estimated from the quadratic regression curve exceeds both
   ten percent and the estimated percentage failures due to EEE. The number that
   appears is the first mileage for which these conditions occur. A period
   appears if these conditions do not occur for any mileage up to 50,000 miles.
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.

Systems Applications Inc.
March 27, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Cause or Contribute Test
50,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	First Mileage at which Failure to Meet Standards Is Caused (. = not caused)(a)	Percent Failures EEE	HT3	Sign ('+'= adverse HT3 effect)
D	.	.	.	-
E	.	.	.	-
F	.	.	.	-
T	.	.	.	-
C	.	.	.	-
G	.	.	.	-
H	.	.	.	-
I	.	.	.	-

EPA Sign Test: Observation of 0 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 100.00 percent significance level(b). (For the purpose of the sign test, only observations with sign = + or - are counted as trials).

Notes:
a. If a number appears in this column then at this mileage, the percentage failures due to HiTEC 3000 estimated from the quadratic regression curve exceeds both ten percent and the estimated percentage failures due to EEE. The number that appears is the first mileage for which these conditions occur. A period appears if these conditions do not occur for any mileage up to 50,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.

Systems Applications Inc.
March 27, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Cause or Contribute Test
50,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	First Mileage at which Failure to Meet Standards Is Caused (. = not caused)(a)	Percent Failures		Sign ('+'= adverse HT3 effect)
		EEE	HT3	
D	18,000	7.63	12.26	+
E	0	7.54	14.70	+
F	.	.	.	-
T	10,000	3.73	10.69	+
C	22,000	6.07	10.19	+
G	.	.	.	-
H	.	.	.	-
I	.	.	.	-

EPA Sign Test: Observation of 4 '+' sign(s) in 8 trials rejects the hypothesis
of no adverse HiTEC 3000 effect at the 63.67 percent significance level(b).
(For the purpose of the sign test, only observations with sign = + or - are
counted as trials).

Notes:
a. If a number appears in this column then at this mileage, the percentage failures
   due to HiTEC 3000 estimated from the quadratic regression curve exceeds both
   ten percent and the estimated percentage failures due to EEE. The number that
   appears is the first mileage for which these conditions occur. A period
   appears if these conditions do not occur for any mileage up to 50,000 miles.
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.

Systems Applications Inc.
March 27, 1990

Attachment E

TABULATED RESULTS FOR ALL STATISTICAL
ANALYSES OF 75,000 MILE DATA

Attachment E
Table of Contents

Description	Version	Data Set	Page Number HC	NO$_x$	CO
1K to 75K test	Equal car effects	ETHYL4S2	E-1	E-2	E-3
	Unequal car effects	ETHYL4S2	E-4	E-5	E-6
1K to 75K test	Equal car effects	ETHYL4S3	E-7	E-8	E-9
	Unequal car effects	ETHYL4S3	E-10	E-11	E-12
Integrated emissions test	1K - 75K	ETHYL4S2	E-13	E-14	E-15
	5K - 75K	ETHYL4S2	E-16	E-17	E-18
Quadratic regression slopes test	25K miles	ETHYL4S2	E-19	E-20	E-21
	50K miles	ETHYL4S2	E-22	E-23	E-24
	75K miles	ETHYL4S2	E-25	E-26	E-27
Quadratic coefficient test	Quadratic regression	ETHYL4S2	E-28	E-29	E-30
Deterioration factors test	Quadratic regression	ETHYL4S2	E-31	E-32	E-33
Linear regression slopes test	55K - 75K	ETHYL4S2	E-34	E-35	E-36
Violation mileage test	Quadratic regression	ETHYL4S2	E-37	E-38	E-39
Maximum percentage of vehicles failing standard test	Quadratic regression	ETHYL4S2	E-40	E-41	E-42
Cause or contribute test	Quadratic regression	ETHYL4S2	E-43	E-44	E-45

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions From 1,000 to 75,000 Miles
(assuming equal car effects)
Data Set ETHYL4S2
Pollutant Hydrocarbons

| Model | Change in Emissions (g/mi) from 1,000 to 75,000 mi(a) | | | ------ Rank Sum Test ------ | | | T-test |
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	0.393	0.343	-	4.0	3.0	80.00	67.30
E	0.147	0.137	-	4.0	4.5	50.00	56.29
F	0.310	0.437	+	0.0	2.0	6.07	18.14
T	0.244	0.193	-	8.0	4.5	95.00	90.58
C	0.079	0.106	+	1.0	4.5	10.00	14.72
G	0.060	0.097	+	1.0	4.5	10.00	4.77
H	0.208	0.244	+	1.0	4.5	10.00	13.22
I	0.016	0.054	+	2.0	4.5	20.00	12.80
Weighted Average(c)	0.167	0.197	+				3.61
Total				21.0	32.0	3.37	

EPA Sign Test: Observation of 5 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 36.33 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 3.37 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 3.61 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 75,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

E-1

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions From 1,000 to 75,000 Miles
(assuming equal car effects)
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

| Model | Change in Emissions (g/mi) from 1,000 to 75,000 mi(a) | | | ------ Rank Sum Test ------ | | | T-test |
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	-0.08	-0.13	-	3.0	3.0	60.00	72.26
E	0.33	0.23	-	7.0	4.5	90.00	82.33
F	1.22	0.30	-	4.0	2.0	93.93	98.55
T	0.18	-0.03	-	8.0	4.5	95.00	87.92
C	0.54	0.30	-	9.0	4.5	100.00	95.31
G	0.37	0.30	-	6.0	4.5	80.00	78.45
H	0.09	-0.10	-	8.0	4.5	95.00	93.20
I	0.37	0.20	-	8.0	4.5	95.00	82.75
Weighted Average(c)	0.39	0.12	-				100.00
Total				53.0	32.0	99.98	

EPA Sign Test: Observation of 0 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 100.00 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 99.98 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 100.00 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 75,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1909

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions From 1,000 to 75,000 Miles
(assuming equal car effects)
Data Set ETHYL4S2
Pollutant Carbon Monoxide

| Model | Change in Emissions (g/mi) from 1,000 to 75,000 mi(a) | | | ------ Rank Sum Test ------ | | | T-test |
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	3.46	3.37	-	4.0	3.0	80.00	70.19
E	4.16	3.48	-	7.0	4.5	90.00	81.03
F	1.63	0.73	-	4.0	2.0	93.93	98.85
T	4.30	2.92	-	9.0	4.5	100.00	98.24
C	1.72	1.73	+	4.0	4.5	50.00	49.19
G	1.44	1.72	+	1.0	4.5	10.00	9.98
H	2.85	2.81	-	5.0	4.5	65.00	53.26
I	1.06	1.02	-	5.0	4.5	65.00	54.50
Weighted Average(c)	2.48	2.12	-				99.07
Total				39.0	32.0	87.78	

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 87.78 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 99.07 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 75,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions from 1,000 to 75,000 Miles
(not assuming equal car effects)
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Change in Emissions from 1,000 to 75,000 mi (g/mi)(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.393	0.343	-	86.69
E	0.147	0.137	-	79.19
F	0.310	0.437	+	0.51
T	0.244	0.193	-	97.25
C	0.079	0.106	+	2.09
G	0.060	0.097	+	0.13
H	0.208	0.244	+	5.90
I	0.016	0.054	+	0.42
Weighted Average(c)	0.167	0.197	+	0.04

EPA Sign Test: Observation of 5 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 36.33 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 0.04 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 75,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

E-4

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions from 1,000 to 75,000 Miles
(not assuming equal car effects)
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Change in Emissions from 1,000 to 75,000 mi (g/mi)(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	-0.08	-0.13	-	92.71
E	0.33	0.23	-	99.81
F	1.22	0.30	-	100.00
T	0.18	-0.03	-	100.00
C	0.54	0.30	-	100.00
G	0.37	0.30	-	99.25
H	0.09	-0.10	-	100.00
I	0.37	0.20	-	100.00
Weighted Average(c)	0.39	0.12	-	100.00

EPA Sign Test: Observation of 0 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 100.00 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 100.00 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 75,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions from 1,000 to 75,000 Miles
(not assuming equal car effects)
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Change in Emissions from 1,000 to 75,000 mi (g/mi)(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	3.46	3.37	-	60.64
E	4.16	3.48	-	99.05
F	1.63	0.73	-	100.00
T	4.30	2.92	-	99.93
C	1.72	1.73	+	47.22
G	1.44	1.72	+	3.34
H	2.85	2.81	-	58.36
I	1.06	1.02	-	55.78
Weighted Average(c)	2.48	2.12	-	100.00

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 100.00 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 75,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions From 1,000 to 75,000 Miles
(assuming equal car effects)
Data Set ETHYL4S3
Pollutant Hydrocarbons

| Model | Change in Emissions (g/mi) from 1,000 to 75,000 mi(a) | | | ------ Rank Sum Test ------ | | | T-test |
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	0.454	0.509	+	2.0	3.0	40.00	31.38
E	0.140	0.125	-	4.0	4.5	50.00	59.56
F	0.360	0.526	+	0.0	2.0	6.07	14.29
T	0.271	0.202	-	9.0	4.5	100.00	94.55
C	0.049	0.092	+	1.0	4.5	10.00	6.74
G	0.049	0.038	-	5.0	4.5	65.00	74.69
H	0.214	0.161	-	8.0	4.5	95.00	93.03
I	0.006	0.005	-	5.0	4.5	65.00	52.88
Weighted Average(c)	0.175	0.180	+				38.09
Total				34.0	32.0	63.03	

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 63.03 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 38.09 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 75,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions From 1,000 to 75,000 Miles
(assuming equal car effects)
Data Set ETHYL4S3
Pollutant Nitrogen Oxides

| Model | Change in Emissions (g/mi) from 1,000 to 75,000 mi(a) | | | ------ Rank Sum Test ------ | | | T-test |
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	-0.14	-0.10	+	2.0	3.0	40.00	32.70
E	0.25	0.17	-	6.0	4.5	80.00	78.18
F	1.28	0.25	-	4.0	2.0	93.93	98.82
T	0.13	-0.07	-	8.0	4.5	95.00	87.06
C	0.65	0.34	-	9.0	4.5	100.00	97.19
G	0.36	0.27	-	6.0	4.5	80.00	83.07
H	0.10	-0.10	-	8.0	4.5	95.00	93.46
I	0.33	0.20	-	5.0	4.5	65.00	77.31
Weighted Average(c)	0.39	0.11	-				100.00
Total				48.0	32.0	99.61	

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of
no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected
at the 99.61 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected
at the 100.00 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 75,000 miles minus the mean of the car-
   means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions From 1,000 to 75,000 Miles
(assuming equal car effects)
Data Set ETHYL4S3
Pollutant Carbon Monoxide

| Model | Change in Emissions (g/mi) from 1,000 to 75,000 mi(a) | | | ------ Rank Sum Test ------ | | | T-test |
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	5.46	4.93	-	6.0	3.0	100.00	97.17
E	4.63	3.32	-	8.0	4.5	95.00	93.45
F	1.47	1.08	-	4.0	2.0	93.93	95.15
T	4.22	2.54	-	9.0	4.5	100.00	98.96
C	1.23	1.40	+	3.0	4.5	35.00	35.06
G	1.36	0.81	-	9.0	4.5	100.00	97.61
H	3.17	1.83	-	9.0	4.5	100.00	98.26
I	0.80	0.86	+	4.0	4.5	50.00	43.42
Weighted Average(c)	2.54	1.79	-				100.00
Total				52.0	32.0	99.96	

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 99.96 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 100.00 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 75,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

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Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions from 1,000 to 75,000 Miles
(not assuming equal car effects)
Data Set ETHYL4S3
Pollutant Hydrocarbons

Model	Change in Emissions from 1,000 to 75,000 mi (g/mi)(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.454	0.509	+	11.32
E	0.140	0.125	-	88.95
F	0.360	0.526	+	0.12
T	0.271	0.202	-	99.27
C	0.049	0.092	+	0.18
G	0.049	0.038	-	86.23
H	0.214	0.161	-	98.43
I	0.006	0.005	-	56.44
Weighted Average(c)	0.175	0.180	+	28.72

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 28.72 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 75,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 23, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions from 1,000 to 75,000 Miles
(not assuming equal car effects)
Data Set ETHYL4S3
Pollutant Nitrogen Oxides

Model	Change in Emissions from 1,000 to 75,000 mi (g/mi)(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	-0.14	-0.10	+	13.41
E	0.25	0.17	-	99.37
F	1.28	0.25	-	100.00
T	0.13	-0.07	-	99.99
C	0.65	0.34	-	100.00
G	0.36	0.27	-	99.82
H	0.10	-0.10	-	100.00
I	0.33	0.20	-	100.00
Weighted Average(c)	0.39	0.11	-	100.00

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 100.00 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 75,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 23, 1990

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Change in Emissions from 1,000 to 75,000 Miles
(not assuming equal car effects)
Data Set ETHYL4S3
Pollutant Carbon Monoxide

Model	Change in Emissions from 1,000 to 75,000 mi (g/mi)(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	5.46	4.93	-	92.27
E	4.63	3.32	-	99.99
F	1.47	1.08	-	99.61
T	4.22	2.54	-	99.98
C	1.23	1.40	+	9.95
G	1.36	0.81	-	99.89
H	3.17	1.83	-	100.00
I	0.80	0.86	+	41.56
Weighted Average(c)	2.54	1.79	-	100.00

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 100.00 percent significance level(b).

Notes:
a. Each figure is the mean of the car-means at 75,000 miles minus the mean of the car-means at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 23, 1990

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Integrated Emissions Test
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Emissions Rate Increase (g/mi) from 1,000 to 75,000 mi(a)			------ Rank Sum Test ------			T-test
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	0.257	0.290	+	1.0	3.0	20.00	14.31
E	0.093	0.100	+	5.0	4.5	65.00	40.89
F	0.347	0.346	-	2.0	2.0	50.00	50.60
T	0.157	0.165	+	4.0	4.5	50.00	32.67
C	0.057	0.090	+	0.0	4.5	5.00	2.85
G	0.034	0.065	+	0.0	4.5	5.00	2.43
H	0.132	0.152	+	2.0	4.5	20.00	19.70
I	0.014	0.034	+	3.0	4.5	35.00	17.24
Weighted Average(c)	0.128	0.145	+				1.83
Total				17.0	32.0	0.63	

EPA Sign Test: Observation of 7 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 3.52 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 0.63 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 1.83 percent significance level(b).

Notes:
a. Each figure is the mean of the emissions rate increases for each car. The emissions rate increase is the estimated total emissions (in g) from 1,000 to 75,000 miles, divided by the accumulated mileage, minus the initial emissions rate at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Integrated Emissions Test
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Emissions Rate Increase (g/mi) from 1,000 to 75,000 mi(a)			Rank Sum Test			T-test
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	-0.08	-0.13	-	5.0	3.0	90.00	76.59
E	0.24	0.17	-	7.0	4.5	90.00	93.23
F	0.56	0.28	-	4.0	2.0	93.93	90.15
T	0.09	-0.11	-	8.0	4.5	95.00	93.52
C	0.33	0.20	-	9.0	4.5	100.00	97.65
G	0.24	0.19	-	9.0	4.5	100.00	97.67
H	0.05	0.01	-	5.0	4.5	65.00	65.73
I	0.24	0.13	-	8.0	4.5	95.00	89.72
Weighted Average(c)	0.22	0.10	-				99.93
Total				55.0	32.0	99.99	

EPA Sign Test: Observation of 0 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 100.00 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 99.99 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 99.93 percent significance level(b).

Notes:
a. Each figure is the mean of the emissions rate increases for each car. The emissions rate increase is the estimated total emissions (in g) from 1,000 to 75,000 miles, divided by the accumulated mileage, minus the initial emissions rate at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Integrated Emissions Test
Data Set ETHYL4S2
Pollutant Carbon Monoxide

| Model | Emissions Rate Increase (g/mi) from 1,000 to 75,000 mi(a) | | | ------ Rank Sum Test ------ | | | T-test |
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	2.57	2.39	-	4.0	3.0	80.00	74.62
E	3.03	2.83	-	5.0	4.5	65.00	66.20
F	1.41	0.64	-	4.0	2.0	93.93	96.02
T	3.11	2.70	-	6.0	4.5	80.00	87.72
C	1.27	1.34	+	2.0	4.5	20.00	35.29
G	1.21	1.22	+	3.0	4.5	35.00	38.62
H	2.30	2.14	-	7.0	4.5	90.00	79.11
I	0.87	0.82	-	5.0	4.5	65.00	60.21
Weighted Average(c)	1.92	1.70	-				99.36
Total				36.0	32.0	74.70	

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 74.70 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected at the 99.36 percent significance level(b).

Notes:
a. Each figure is the mean of the emissions rate increases for each car. The emissions rate increase is the estimated total emissions (in g) from 1,000 to 75,000 miles, divided by the accumulated mileage, minus the initial emissions rate at 1,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 20, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Integrated Emissions Test
Data Set ETHYL4S2
Pollutant Hydrocarbons

| Model | Emissions Rate Increase (g/mi) from 5,000 to 75,000 mi(a) | | | ------ Rank Sum Test ------ | | | T-test |
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	0.259	0.265	+	2.0	3.0	40.00	32.33
E	0.066	0.047	-	6.0	4.5	80.00	77.17
F	0.291	0.274	-	2.0	2.0	50.00	75.21
T	0.123	0.124	+	5.0	4.5	65.00	47.55
C	0.039	0.063	+	3.0	4.5	35.00	16.32
G	0.024	0.051	+	0.0	4.5	5.00	0.62
H	0.131	0.120	-	6.0	4.5	80.00	63.08
I	0.018	0.023	+	4.0	4.5	50.00	36.41
Weighted Average(c)	0.111	0.110	-				54.13
Total				28.0	32.0		25.30

EPA Sign Test: Observation of 5 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 36.33 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 25.30 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 54.13 percent significance level(b).

Notes:
a. Each figure is the mean of the emissions rate increases for each car. The emissions rate increase is the estimated total emissions (in g) from 5,000 to 75,000 miles, divided by the accumulated mileage, minus the initial emissions rate at 5,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 21, 1990

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Integrated Emissions Test
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

| Model | Emissions Rate Increase (g/mi) from 5,000 to 75,000 mi(a) | | | ------ Rank Sum Test ------ | | | T-test |
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	-0.10	-0.07	+	2.0	3.0	40.00	23.74
E	0.15	0.17	+	4.0	4.5	50.00	26.76
F	0.47	0.13	-	4.0	2.0	93.93	86.23
T	0.01	0.05	+	4.0	4.5	50.00	38.36
C	0.20	0.09	-	9.0	4.5	100.00	95.55
G	0.16	0.11	-	9.0	4.5	100.00	99.28
H	0.07	-0.11	-	9.0	4.5	100.00	99.60
I	0.09	0.10	+	3.0	4.5	35.00	46.29
Weighted Average(c)	0.14	0.05	-				98.99
Total				44.0	32.0	97.70	

EPA Sign Test: Observation of 4 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 63.67 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 97.70 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 98.99 percent significance level(b).

Notes:
a. Each figure is the mean of the emissions rate increases for each car. The emissions rate increase is the estimated total emissions (in g) from 5,000 to 75,000 miles, divided by the accumulated mileage, minus the initial emissions rate at 5,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 21, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

Integrated Emissions Test
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Emissions Rate Increase (g/mi) from 5,000 to 75,000 mi(a)			------ Rank Sum Test ------			T-test
	EEE	HT3	Sign	Test Statistic	Mean	Sig.Level (%)(b)	Sig.Level (%)(b)
D	2.63	2.49	-	4.0	3.0	80.00	69.69
E	2.68	1.90	-	9.0	4.5	100.00	98.80
F	1.23	0.53	-	4.0	2.0	93.93	94.94
T	2.62	2.00	-	8.0	4.5	95.00	95.40
C	1.11	1.11	-	3.0	4.5	35.00	51.76
G	0.78	0.94	+	0.0	4.5	5.00	0.31
H	2.22	2.00	-	7.0	4.5	90.00	83.75
I	0.69	0.66	-	5.0	4.5	65.00	56.96
Weighted Average(c)	1.70	1.40	-				99.99
Total				40.0	32.0	90.83	

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

EPA Overall Rank Sum Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 90.83 percent significance level(b).

Weighted Average Test: The hypothesis of no adverse HiTEC 3000 effect is rejected 99.99 percent significance level(b).

Notes:
a. Each figure is the mean of the emissions rate increases for each car. The emissions rate increase is the estimated total emissions (in g) from 5,000 to 75,000 miles, divided by the accumulated mileage, minus the initial emissions rate at 5,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 21, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

25,000 Mile Quadratic Regression Slope Test
75,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	25K Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.083	0.088	+	27.05
E	0.022	0.017	-	87.82
F	0.099	0.093	-	83.36
T	0.040	0.044	+	14.47
C	0.011	0.017	+	2.47
G	0.007	0.014	+	0.07
H	0.037	0.042	+	20.40
I	0.003	0.005	+	14.30
Weighted Average(c)	0.035	0.037	+	12.91

EPA Sign Test: Observation of 6 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 14.45 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 12.91 percent significance level(b).

Notes:
a. The 25k deterioration rate is the rate of increase per 10,000 miles at 25,000 miles (slope of the quadratic regression curve at 25,000 miles).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 22, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

25,000 Mile Quadratic Regression Slope Test
75,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	25K Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	-0.03	-0.03	-	62.93
E	0.05	0.05	+	44.35
F	0.12	0.04	-	99.96
T	-0.00	0.01	+	22.71
C	0.07	0.03	-	100.00
G	0.04	0.03	-	87.26
H	0.02	-0.02	-	99.95
I	0.03	0.01	-	93.70
Weighted Average(c)	0.04	0.01	-	100.00

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 100.00 percent significance level(b).

Notes:
a. The 25k deterioration rate is the rate of increase per 10,000 miles at 25,000 miles (slope of the quadratic regression curve at 25,000 miles).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 22, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

25,000 Mile Quadratic Regression Slope Test
75,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	25K Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.84	0.75	-	89.32
E	0.83	0.65	-	97.47
F	0.39	0.18	-	100.00
T	0.89	0.77	-	86.94
C	0.28	0.30	+	30.80
G	0.23	0.26	+	20.28
H	0.67	0.65	-	63.69
I	0.17	0.12	-	87.38
Weighted Average(c)	0.52	0.45	-	99.90

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 99.90 percent significance level(b).

Notes:
a. The 25k deterioration rate is the rate of increase per 10,000 miles at 25,000 miles (slope of the quadratic regression curve at 25,000 miles).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
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Ethyl Corporation HiTEC 3000 Fleet Testing Program

50,000 Mile Quadratic Regression Slope Test
75,000 Mile Analysis
Data Set ETHYL4S2
Pollutant. Hydrocarbons

Model	50K Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.036	0.011	-	99.93
E	0.019	0.010	-	97.55
F	-0.002	0.014	+	1.04
T	0.021	0.006	-	99.99
C	0.003	-0.000	-	89.14
G	0.004	0.003	-	64.85
H	0.028	0.037	+	2.81
I	0.002	0.003	+	31.77
Weighted Average(c)	0.013	0.014	+	37.58

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 37.58 percent significance level(b).

Notes:
a. The 50k deterioration rate is the rate of increase per 10,000 miles at 50,000 miles (slope of the quadratic regression curve at 50,000 miles).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 22, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

50,000 Mile Quadratic Regression Slope Test
75,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	50K Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.04	0.02	-	92.82
E	0.03	0.02	-	97.73
F	0.19	0.06	-	100.00
T	0.04	0.05	+	27.59
C	0.06	0.02	-	99.97
G	0.01	0.00	-	88.20
H	0.01	-0.04	-	100.00
I	0.04	0.00	-	99.99
Weighted Average(c)	0.05	0.01	-	100.00

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 100.00 percent significance level(b).

Notes:
a. The 50k deterioration rate is the rate of increase per 10,000 miles at 50,000 miles (slope of the quadratic regression curve at 50,000 miles).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
March 22, 1990

Ethyl Corporation HiTEC 3000 Fleet Testing Program

50,000 Mile Quadratic Regression Slope Test
75,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	50K Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.44	0.34	-	91.20
E	0.51	0.21	-	99.96
F	0.26	0.11	-	99.99
T	0.63	0.36	-	99.65
C	-0.01	-0.00	+	48.24
G	0.05	0.10	+	8.67
H	0.19	0.25	+	11.84
I	0.09	0.02	-	95.86
Weighted Average(c)	0.25	0.16	-	99.98

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 99.98 percent significance level(b).

Notes:
a. The 50k deterioration rate is the rate of increase per 10,000 miles at 50,000 miles (slope of the quadratic regression curve at 50,000 miles).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
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Ethyl Corporation HiTEC 3000 Fleet Testing Program

75,000 Mile Quadratic Regression Slope Test
75,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	75K Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	-0.011	-0.066	-	99.81
E	0.016	0.004	-	86.88
F	-0.104	-0.065	+	1.04
T	0.002	-0.033	-	99.98
C	-0.004	-0.017	-	96.79
G	0.001	-0.008	-	95.45
H	0.018	0.033	+	11.16
I	0.001	0.000	-	52.89
Weighted Average(c)	-0.008	-0.009	-	58.41

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 58.41 percent significance level(b).

Notes:
a. The 75k deterioration rate is the rate of increase per 10,000 miles at 75,000 miles (slope of the quadratic regression curve at 75,000 miles)
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
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Ethyl Corporation HiTEC 3000 Fleet Testing Program

75,000 Mile Quadratic Regression Slope Test
75,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	75K Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.10	0.08	-	85.72
E	0.01	-0.01	-	95.55
F	0.26	0.08	-	99.96
T	0.08	0.09	+	43.39
C	0.05	0.02	-	87.62
G	-0.01	-0.02	-	68.70
H	-0.00	-0.06	-	98.40
I	0.05	-0.01	-	99.26
Weighted Average(c)	0.06	0.01	-	100.00

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 100.00 percent significance level(b).

Notes:
a. The 75k deterioration rate is the rate of increase per 10,000 miles at 75,000 miles (slope of the quadratic regression curve at 75,000 miles).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

75,000 Mile Quadratic Regression Slope Test
75,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	75K Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.03	-0.07	-	72.23
E	0.18	-0.24	-	97.45
F	0.12	0.04	-	82.08
T	0.36	-0.06	-	95.75
C	-0.29	-0.31	-	57.09
G	-0.13	-0.06	+	22.27
H	-0.29	-0.15	+	13.08
I	0.01	-0.08	-	82.38
Weighted Average(c)	-0.03	-0.12	-	94.95

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 94.95 percent significance level(b).

Notes:
a. The 75k deterioration rate is the rate of increase per 10,000 miles at 75,000 miles (slope of the quadratic regression curve at 75,000 miles).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Quadratic Coefficient Test
75,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Acceleration (a) (units per 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	-0.009	-0.015	-	99.28
E	-0.001	-0.001	-	68.43
F	-0.020	-0.016	+	1.68
T	-0.004	-0.008	-	99.88
C	-0.002	-0.003	-	98.06
G	-0.001	-0.002	-	99.07
H	-0.002	-0.001	+	25.32
I	-0.000	-0.000	-	65.87
Weighted Average(c)	-0.004	-0.005	-	70.22

EPA Sign Test: Observation of 2 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 96.48 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 70.22 percent significance level(b).

Notes:
a. The acceleration is the quadratic coefficient of the quadratic regression curve (half the rate of increase of the deterioration rate).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Quadratic Coefficient Test
75,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Acceleration (a) (units per 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	0.01	0.01	-	76.33
E	-0.00	-0.01	-	91.24
F	0.01	0.00	-	94.95
T	0.01	0.01	-	54.59
C	-0.00	-0.00	+	32.95
G	-0.01	-0.01	-	50.09
H	-0.00	-0.00	-	71.26
I	0.00	-0.00	-	91.47
Weighted Average(c)	0.00	-0.00	-	97.89

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 97.89 percent significance level(b).

Notes:
a. The acceleration is the quadratic coefficient of the quadratic regression curve (half the rate of increase of the deterioration rate).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Quadratic Coefficient Test
75,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Acceleration (a) (units per 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	-0.08	-0.08	-	51.90
E	-0.07	-0.09	-	80.56
F	-0.03	-0.01	+	12.78
T	-0.05	-0.08	-	83.14
C	-0.06	-0.06	-	61.87
G	-0.04	-0.03	+	37.62
H	-0.10	-0.08	+	16.40
I	-0.02	-0.02	-	63.10
Weighted Average(c)	-0.05	-0.06	-	59.78

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 59.78 percent significance level(b).

Notes:
a. The acceleration is the quadratic coefficient of the quadratic regression curve (half the rate of increase of the deterioration rate).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Quadratic Regression Deterioration Factors Test
75,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Deterioration Factor(a) EEE	HT3	Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
D	2.427	2.038	-	96.48
E	2.192	1.612	-	99.39
F	2.331	2.401	+	38.09
T	1.970	1.661	-	99.53
C	1.312	1.291	-	58.66
G	1.331	1.465	+	9.80
H	2.178	2.494	+	6.99
I	1.085	1.154	+	14.12
Weighted Average(c)	1.834	1.828	-	53.38

EPA Sign Test: Observation of 4 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 63.67 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 53.38 percent significance level(b).

Notes:
a. The deterioration factor is the fitted (from the quadratic regression) 75,000 mile emissions divided by the fitted 4,000 mile emissions.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures. The weighted average deterioration factor is not the ratio of the averages at 4,000 and 75,000 miles.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Quadratic Regression Deterioration Factors Test
75,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Deterioration Factor(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	1.12	1.01	-	93.63
E	2.10	1.97	-	73.83
F	2.78	1.64	-	100.00
T	1.21	1.41	+	2.52
C	3.24	1.92	-	99.89
G	1.68	1.43	-	94.27
H	1.23	0.56	-	100.00
I	1.71	1.13	-	99.97
Weighted Average(c)	1.85	1.29	-	100.00

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 100.00 percent significance level(b).

Notes:
a. The deterioration factor is the fitted (from the quadratic regression) 75,000 mile emissions divided by the fitted 4,000 mile emissions.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures. The weighted average deterioration factor is not the ratio of the averages at 4,000 and 75,000 miles.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Quadratic Regression Deterioration Factors Test
75,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Deterioration Factor(a)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	3.76	3.10	-	88.84
E	2.87	1.88	-	99.98
F	4.14	2.45	-	99.86
T	3.98	2.83	-	96.74
C	1.48	1.50	+	45.68
G	1.74	2.01	+	8.82
H	2.69	3.09	+	11.54
I	1.47	1.24	-	97.95
Weighted Average(c)	2.69	2.27	-	99.83

EPA Sign Test: Observation of 3 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 85.55 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 99.83 percent significance level(b).

Notes:
a. The deterioration factor is the fitted (from the quadratic regression) 75,000 mile emissions divided by the fitted 4,000 mile emissions.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures. The weighted average deterioration factor is not the ratio of the averages at 4,000 and 75,000 miles.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Linear Regression Slopes Test
Post 50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	-0.053	-0.026	+	22.36
E	0.006	0.009	+	46.18
F	-0.036	0.014	+	4.58
T	0.031	-0.013	-	99.49
C	0.008	0.016	+	23.97
G	0.014	0.016	+	42.43
H	-0.011	-0.016	-	58.14
I	0.007	0.014	+	19.13
Weighted Average(c)	-0.002	0.002	+	32.95

EPA Sign Test: Observation of 6 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 14.45 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 32.95 percent significance level(b).

Notes:
a. The deterioration rate is the rate of increase per 10,000 miles (slope of the linear regression line).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

Systems Applications Inc.
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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Linear Regression Slopes Test
Post 50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	-0.07	-0.01	+	2.01
E	-0.00	-0.02	-	72.75
F	0.19	0.00	-	91.20
T	-0.01	-0.02	-	65.41
C	0.00	0.00	-	50.45
G	0.05	0.04	-	63.84
H	0.01	-0.02	-	91.62
I	0.08	0.08	-	50.21
Weighted Average(c)	0.04	0.01	-	93.66

EPA Sign Test: Observation of 1 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 99.61 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 93.66 percent significance level(b).

Notes:
a. The deterioration rate is the rate of increase per 10,000 miles (slope of the linear regression line).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Linear Regression Slopes Test
Post 50,000 Mile Analysis
Data Set ETHYL4S2
Pollutant Carbon Monoxide

Model	Deterioration Rate(a) (rate / 10,000 mi)		Sign ('+'= adverse HT3 effect)	T-test Significance Level (%)(b)
	EEE	HT3		
D	-0.44	0.25	+	4.14
E	-0.29	-0.28	+	49.12
F	-0.30	-0.12	+	17.41
T	-0.57	-0.67	-	57.24
C	0.20	0.17	-	56.20
G	-0.14	-0.17	-	58.08
H	-0.50	-0.36	+	24.74
I	0.18	0.23	+	36.72
Weighted Average(c)	-0.24	-0.16	+	22.51

EPA Sign Test: Observation of 5 '+' sign(s) in 8 trials rejects the hypothesis of no adverse HiTEC 3000 effect at the 36.33 percent significance level(b).

Weighted Average Test: The hypothesis of no overall adverse HiTEC 3000 effect is rejected at the 22.51 percent significance level(b).

Notes:
a. The deterioration rate is the rate of increase per 10,000 miles (slope of the linear regression line).
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.
c. The weights for the weighted averages are proportional to 1988 sales figures.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Violation Mileage Test
75,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Hydrocarbons

Model	Violation Mileage(a) (miles)		Sign ('+'= adverse HT3 effect)
	EEE	HT3	
D	15,622	11,926	+
E	99,000	99,000	0
F	16,308	16,371	-
T	64,843	39,644	+
C	99,000	99,000	0
G	99,000	99,000	0
H	72,367	59,943	+
I	99,000	99,000	0

EPA Sign Test: Observation of 3 '+' sign(s) in 4 trial(s) rejects the hypothesis of no adverse HiTEC 3000 effect at the 31.25 percent significance level(b). (For the purpose of the sign test, only observations with sign = + or - are counted as trials.)

Notes:
a. The violation mileage is the mileage (fitted by the quadratic regression curve) at which the standard is reached. Violation mileage = 0 if the zero mile emissions exceed the standard. Violation mileage = 99,000 if the regression curve lies entirely below the standard between 0 and 75,000 miles.
b. The lower the significance level, the greater the evidence of an adverse HiTEC 3000 effect.

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Ethyl Corporation HiTEC 3000 Fleet Testing Program

Violation Mileage Test
75,000 Mile Analysis
(based on quadratic regression)
Data Set ETHYL4S2
Pollutant Nitrogen Oxides

Model	Violation Mileage(a) (miles)		Sign ('+'= adverse HT3 effect)
	EEE	HT3	
D	99,000	99,000	0
E	99,000	99,000	0
F	38,751	99,000	-
T	99,000	99,000	0
C	99,000	99,000	0
G	99,000	99,000	0
H	99,000	99,000	0
I	99,000	99,000	0

EPA Sign Test: Observation of 0 '+' sign(s) in 1 trial(s) rejects the hypothesis
of no adverse HiTEC 3000 effect at the 100.00 percent significance level(b).
(For the purpose of the sign test, only observations with sign = + or - are
counted as trials.)

Notes:
a. The violation mileage is the mileage (fitted by the quadratic regression
   curve) at which the standard is reached. Violation mileage = 0 if the
   zero mile emissions exceed the standard. Violation mileage = 99,000 if
   the regression curve lies entirely below the standard between 0 and
   75,000 miles.
b. The lower the significance level, the greater the evidence of an adverse
   HiTEC 3000 effect.

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